Supplement Material

Method S. Search strategies

Table S1. Newcastle-Ottawa quality assessment scale of included studies (cohort studies)

Table S2. Newcastle-Ottawa quality assessment scale of included studies (case-control studies)

Figure S1. Sensitivity analysis in invasive aspergillosis

Figure S2. Funnel plots and Egger test in invasive aspergillosis

Figure S3. Subgroup analysis in invasive aspergillosis group: CMV disease/syndrome vs Asymptomatic CMV viremia/infection

Figure S4. Subgroup analysis in invasive aspergillosis group by study period: Before 2003 vs After 2003

Figure S5. Subgroup analysis in invasive aspergillosis group: Early IA vs Late IA

Figure S6. Subgroup analysis in invasive aspergillosis group: Intra-abdominal transplantation vs Intra-thoracic transplantation

Figure S7. Subgroup analysis by adjustment of effect estimates between cytomegalovirus and invasive aspergillosis

Method S. Search Strategy:

OVID Medline: retrieved 258 articles

1. Cytomegalovirus
2. exp cytomegalovirus infection
3. Cytomegalovirus.tw.
4. cmv.tw.
5. 1 or 2 or 3 or 4
6. exp Aspergillus or Aspergillus.mp.
7. Aspergillosis.mp. or exp invasive pulmonary Aspergillosis or exp Pulmonary Aspergillosis or exp Aspergillosis, Allergic Bronchopulmonary
8. Aspergill*.mp.
9. 6 or 7 or 8
10. Organ transplantation
11. exp heart transplantation
12. exp lung transplantation
13. exp kidney transplantation
14. exp liver transplantation
15. exp pancreas transplantation
16. Intestinal transplantation.mp.
17. ((Organ or heart or lung or renal or liver or pancreas or intestinal) adj transplant$).tw.
18. or/10-17
19. 5 and 9 and 18

Embase: retrieved 1,230 articles

1. 'Cytomegalovirus'/exp OR 'cytomegalovirus'
2. 'Cytomegalovirus infection'
3. cmv
4. 1 OR 2 OR 3
5. 'Aspergillosis'/exp OR 'aspergillosis'
6. 'Aspergillus'/exp OR 'aspergillus'
7. Aspergill*:ti,ab
8. 'invasive aspergillosis'/exp OR 'invasive aspergillosis'
9. 'Lung aspergillosis'/exp OR 'lung aspergillosis'
10. 5 OR 6 OR 7 OR 8 OR 9
11. 'organ transplantation'/exp OR 'organ transplantation'
12. 'heart transplantation'/exp OR 'heart transplantation'
13. 'lung transplantation'/exp OR 'lung transplantation'
14. 'kidney transplantation'/exp OR 'kidney transplantation'
15. 'liver transplantation'/exp OR 'liver transplantation'
16. 'pancreas transplantation'/exp OR 'pancreas transplantation'
17. 'intestinal transplantation'/exp OR 'intestinal transplantation'
18. (organ OR heart OR lung OR renal OR liver OR intestinal) AND transplant$
19. 11 OR 12 OR 13 OR 14 OR 15 OR 16 OR 17 OR 18
20. 4 AND 10 AND 19

ISI Web of Science: retrieved 280 articles

1. ALL=Cytomegalovirus
2. ALL=(cytomegalovirus infection*)
3. ALL=cmv
4. 1 OR 2 OR 3
5. ALL=Aspergillus
6. ALL=Aspergillosis
7. ALL=Aspergill*
8. ALL=(Pulmonary aspergill*)
9. 5 OR 6 OR 7 OR 8
10. ALL=(Organ transplantation*)
11. ALL=(Heart transplantation*)
12. ALL=(Lung transplantation*)
13. ALL=((Kidney OR Renal) AND (transplantation*))
14. ALL=(Liver transplantation*)
15. ALL=(Pancreas transplantation*)
16. ALL=((Intestine OR Intestinal OR Small bowel) AND (transplantation*))
17. 10 OR 11 OR 12 OR 13 OR 14 OR 15 OR 16
18. 4 and 9 and 17

Table S1. Newcastle-Ottawa quality assessment scale of included cohort studies

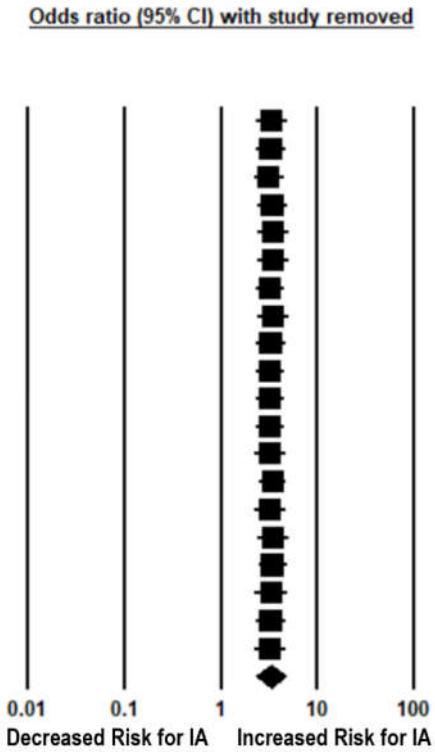
Study/Year	Selection				Comparability	Outcome			Total score
	Representativeness	Selection of the non-exposed cohort	Ascertainment	Endpoint does not present at start	Comparability (Confounding)	Assessment of outcome	Follow-up duration	Adequacy follow-up	
He, 2013	*	*	*	*		*	*	*	7
Kato, 2014	*	*		*	**	*	*	*	8
Monforte, 2001	*	*		*	**	*	*	*	8
Munoz, 2004	*	*		*	**	*	*	*	8

Table S2. Newcastle-Ottawa quality assessment scale of included case-control studies

Study/Year	Selection				Comparability	Exposure			Total score
	Case Definition	Representativeness	Selection of Controls	Definition of Controls	Comparability (Confounding)	Ascertainment of exposure	Ascertainment method	Non-response rate	
Desbois, 2016	*	*	*	*	**	*	*	*	9
Fortun, 2002	*	*	*	*	**	*	*	*	9
Fortun, 2003	*	*	*	*	**			*	7
Gavalda, 2005	*	*	*	*	*	*	*	*	8
Heylen, 2015	*	*	*	*	**	*	*	*	9
Husni, 1998	*	*	*	*		*	*	*	7
Lopez-Medrano, 2016	*	*	*	*	**	*	*	*	9
Lopez-Medrano, 2018	*	*	*	*	**	*	*	*	9
Nagao, 2016		*	*	*	**	*	*	*	8
Neofytos, 2018	*	*	*	*	**	*	*	*	9
Osawa, 2007	*	*	*	*	**			*	7
Rosenhagen, 2009	*	*	*	*		*	*	*	7

Figure S1. Sensitivity analysis in invasive aspergillosis

Study name	Point	Lower limit	Upper limit	p-Value
Desbois 2016	3.373	2.333	4.877	0.000
Fortun 2002 (CMV infection)	3.296	2.289	4.747	0.000
Fortun 2002 (CMV disease)	3.124	2.199	4.439	0.000
Fortun 2003	3.401	2.388	4.844	0.000
Gavalda 2005 (early IA)	3.462	2.369	5.061	0.000
Gavalda 2005 (late IA)	3.500	2.395	5.115	0.000
He 2013	3.186	2.270	4.471	0.000
Heylen 2015	3.468	2.409	4.991	0.000
Husni 1998	3.283	2.273	4.742	0.000
Kato 2014	3.174	2.273	4.432	0.000
Lopez-Medrano 2016	3.217	2.261	4.579	0.000
Lopez-Medrano 2018	3.205	2.258	4.548	0.000
Monforte 2001	3.243	2.250	4.675	0.000
Munoz 2004 (asymptomatic CMV)	3.429	2.516	4.674	0.000
Munoz 2004 (CMV disease)	3.195	2.204	4.633	0.000
Munoz 2004 (CMV syndrome)	3.441	2.385	4.965	0.000
Nagao 2016	3.421	2.438	4.800	0.000
Neofytos 2018	3.304	2.239	4.877	0.000
Osawa 2007	3.284	2.293	4.702	0.000
Rosenhagen 2009	3.222	2.244	4.626	0.000
Total	3.311	2.335	4.693	0.000



CI: confidence interval; CMV: Cytomegalovirus; IA: invasive aspergillosis

Figure S2. Funnel plots and Egger test in invasive aspergillosis

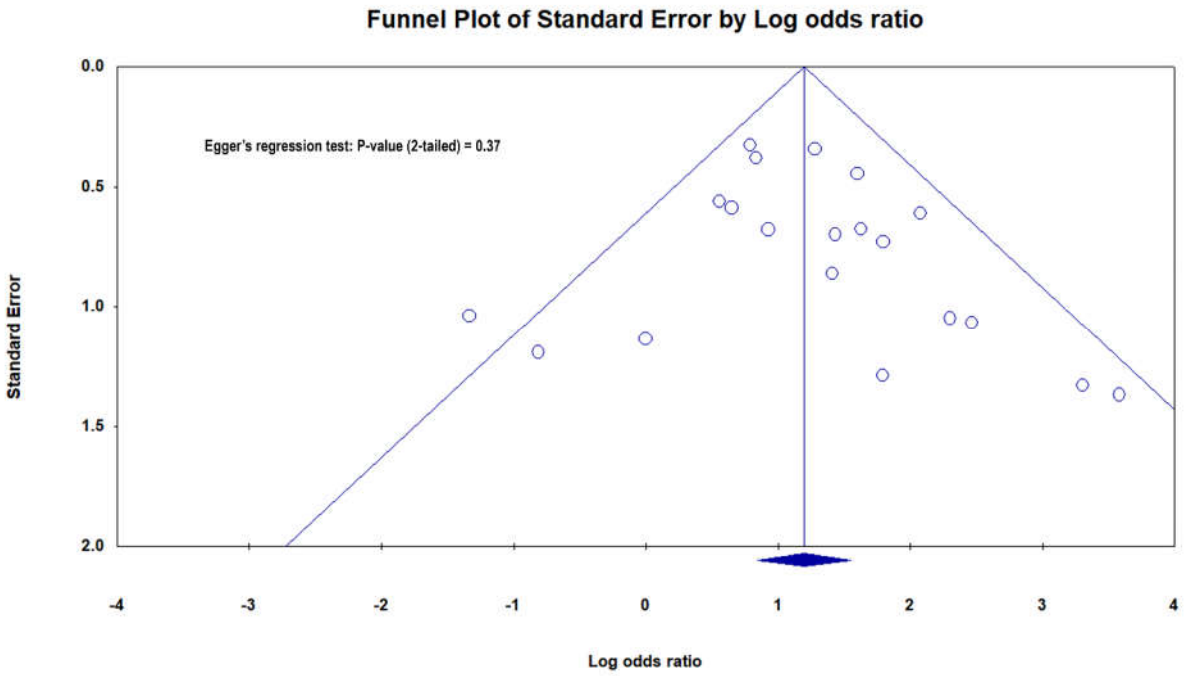
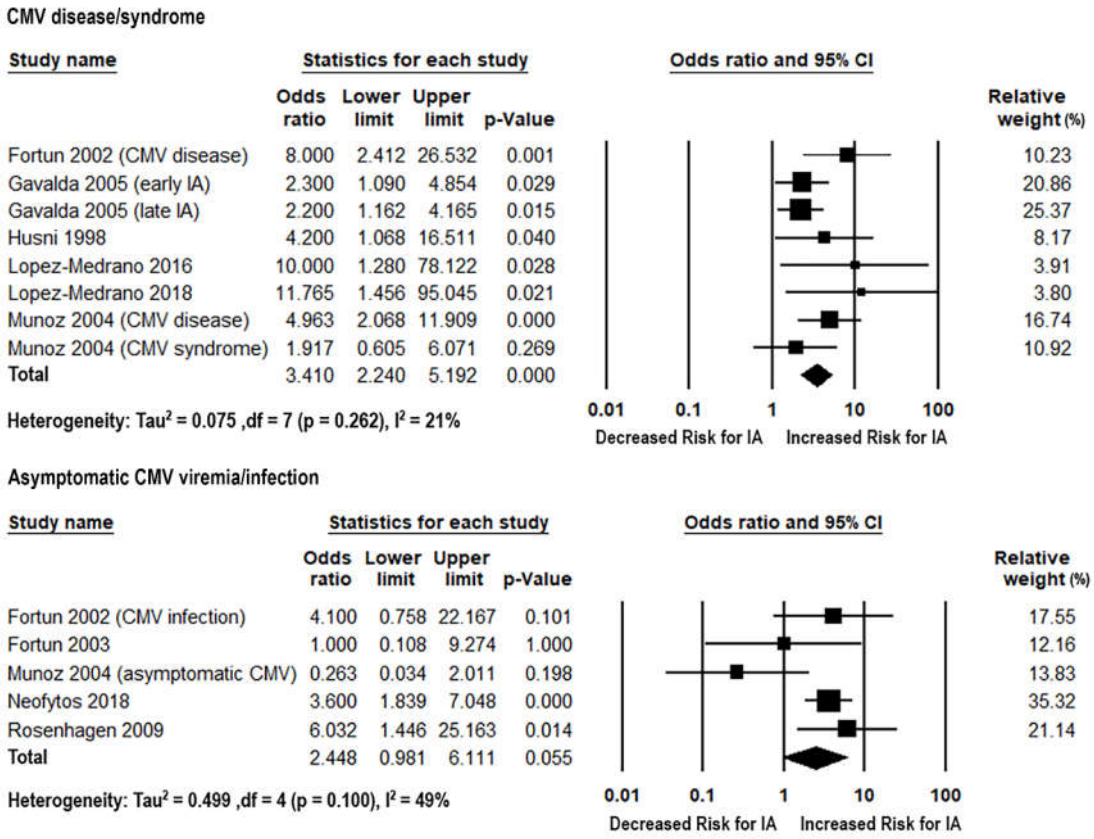
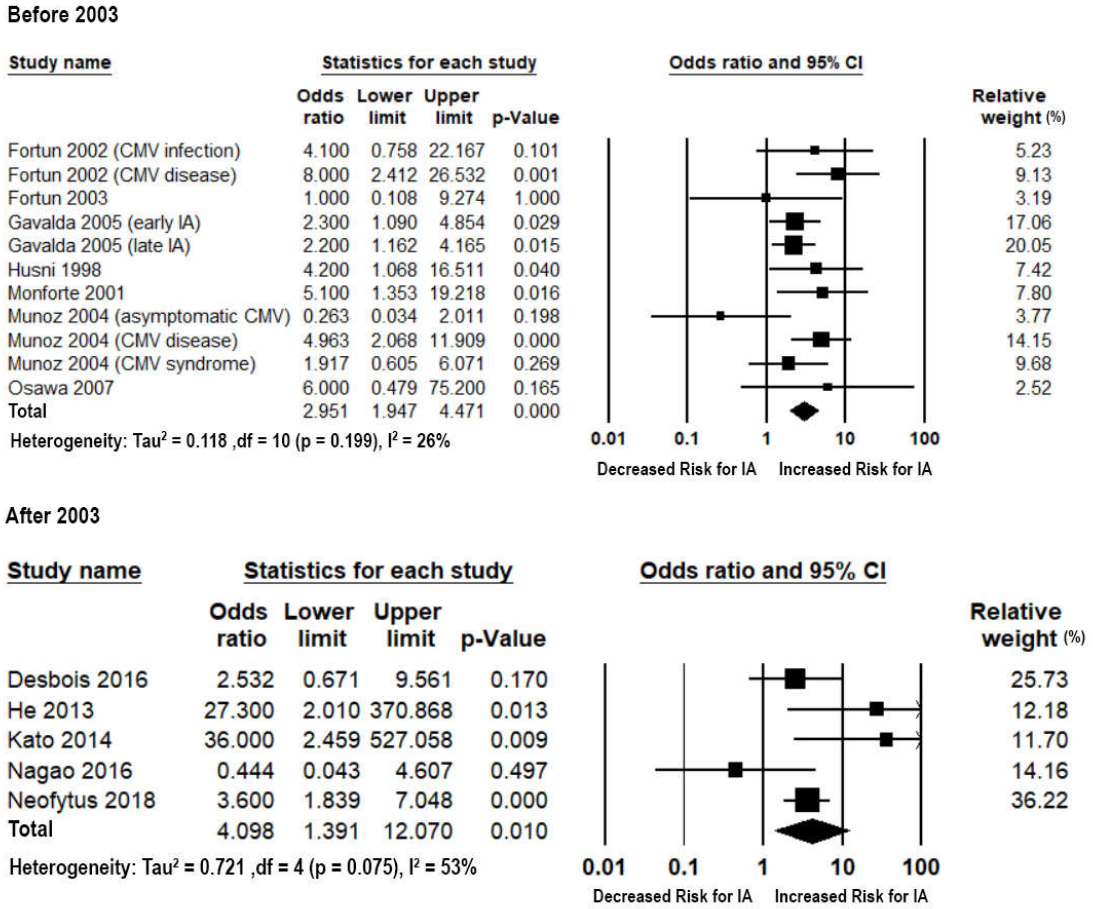


Figure S3. Subgroup analysis in invasive aspergillosis group: CMV disease/syndrome vs Asymptomatic CMV viremia/infection



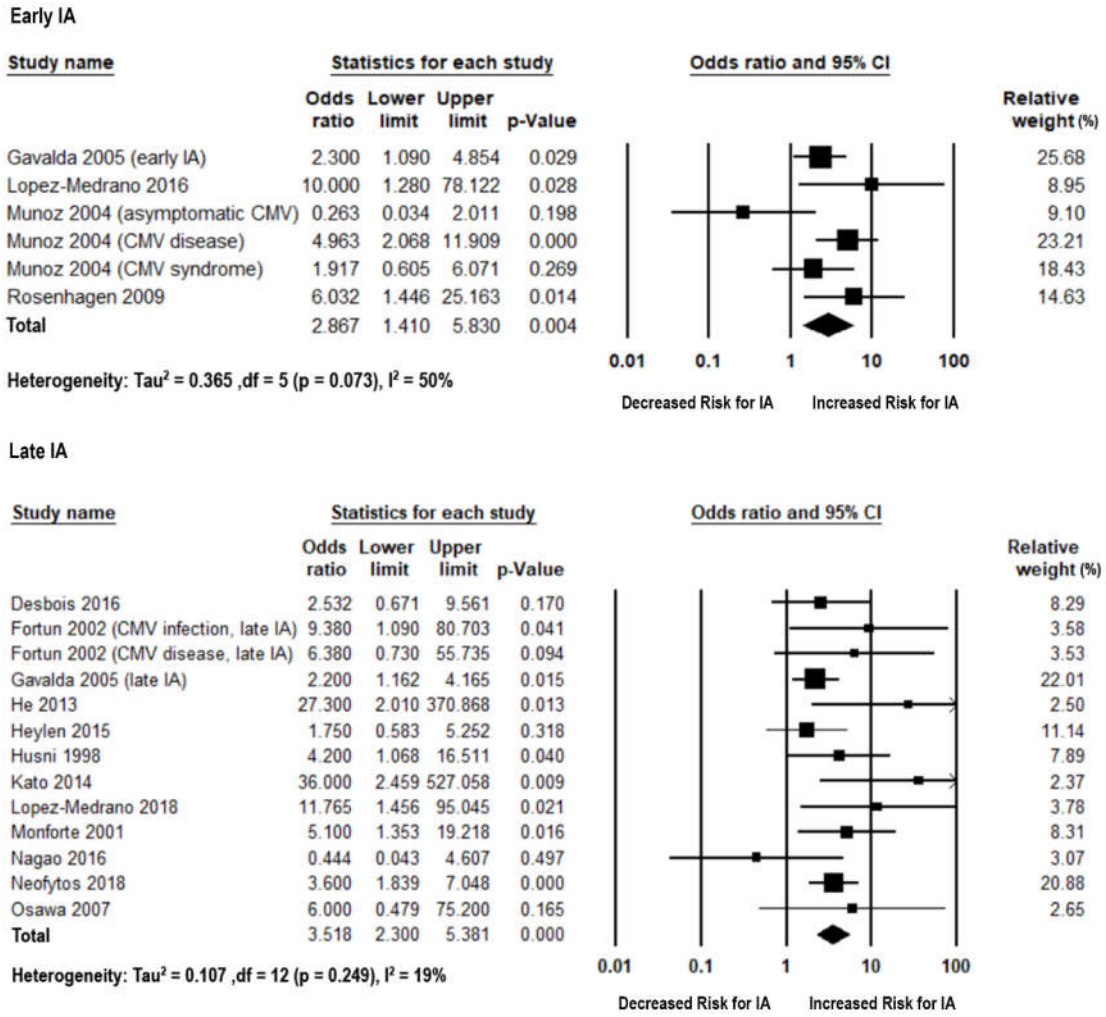
CI: confidence interval; CMV: Cytomegalovirus; IA: invasive aspergillosis

Figure S4. Subgroup analysis in invasive aspergillosis group by study period: Before 2003 vs After 2003



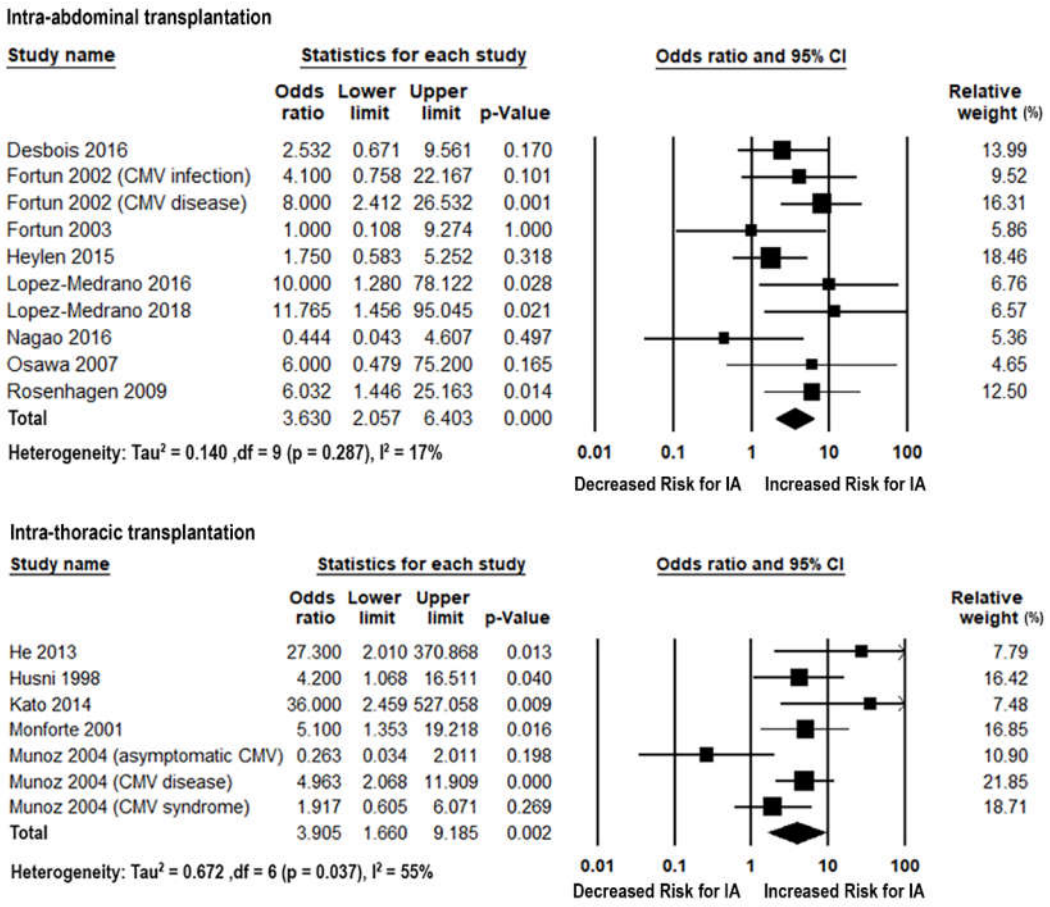
CI: confidence interval; IA: invasive aspergillosis

Figure S5. Subgroup analysis in invasive aspergillosis group: Early IA vs Late IA



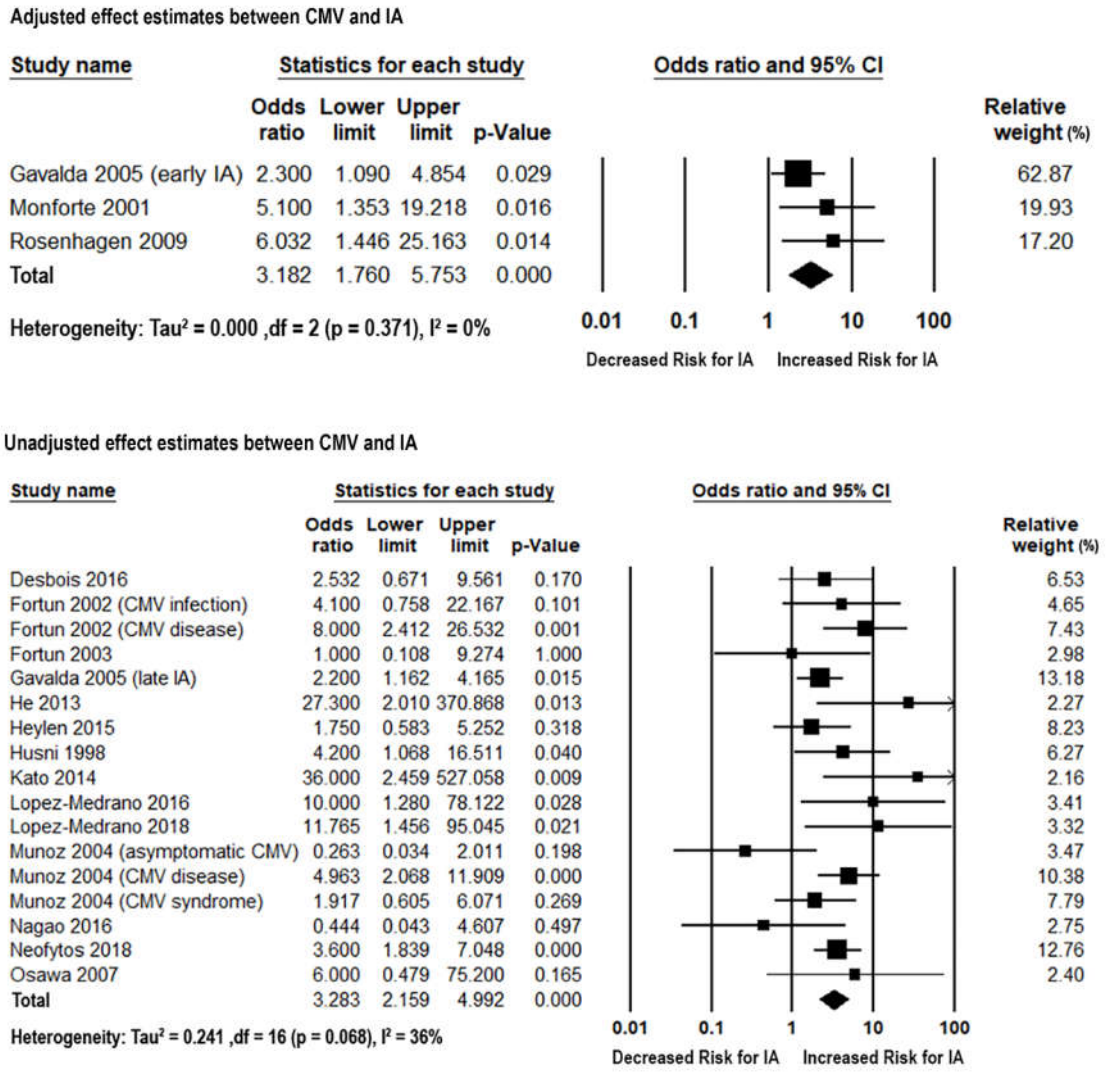
CI: confidence interval; IA: invasive aspergillosis

Figure S6. Subgroup analysis in invasive aspergillosis group: Intra-abdominal transplantation vs Intra-thoracic transplantation



CI: confidence interval; IA: invasive aspergillosis

Figure S7. Subgroup analysis by adjustment of effect estimates between cytomegalovirus and invasive aspergillosis



CI: confidence interval; CMV: Cytomegalovirus; IA: invasive aspergillosis